

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of Nobuo OI et al.

Serial No.: 10/540,512                    Group Art Unit: 1713

Filed : June 23, 2005                    Examiner : Fred M. Teskin

For : PROCESS FOR PRODUCING OLEFIN-BASED COPOLYMER

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**DECLARATION UNDER 37 C.F.R. § 1.132**

Honorable Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

I, Nobuo OI, a Japanese citizen residing at 4-3-13,  
Saginumadai, Narashino-shi, Chiba, Japan,  
declare:

That I am one of co-inventors of the above-identified  
application;

That I am familiar with the prosecution history of the  
above-identified application; and

That the following experiments were conducted by me or under  
my direct supervision.

**1. EXPERIMENT**

Experiment 1 (Comparative Example)

9.5 Grams of ethylene-vinylcyclohexane-1,5-hexadiene

copolymer were prepared in the same manner as in Example 1 in the specification of the above-identified application except that 8 ml of hydrated toluene was changed to 10 ml of hydrated toluene and the p-divinylbenzene solution in which p-divinylbenzene was dissolved in 2.5 ml of toluene was changed to 0.6 ml of 1,5-hexadiene. The copolymer had an intrinsic viscosity  $[\eta]$  of 0.40 dl/g.

**Experiment 2 (Claimed invention)**

14.1 Grams of ethylene-vinylcyclohexane-1,7-octadiene copolymer were prepared in the same manner as in Experiment 1 except that 0.6 ml of 1,5-hexadiene was changed to 0.75 ml of 1,7-octadiene. The copolymer had an intrinsic viscosity  $[\eta]$  of 0.58 dl/g.

**Experiment 3 (Claimed invention)**

10.0 Grams of ethylene-vinylcyclohexane-1,9-decadiene copolymer were prepared in the same manner as in Experiment 1 except that 0.6 ml of 1,5-hexadiene was changed to 0.91 ml of 1,9-decadiene. The copolymer was insoluble to toluene and o-dichlorobenzene because the molecular weight was too high due to cross-linking, and had a glass transition temperature of 71°C.

**2. RESULTS**

Results of Experiments 1-3, and Examples 1-3 and Comparative Example 1 of the specification in the above-identified application are shown in Table attached hereto for comparison.

### 3. CONSIDERATION

(1) From comparisons of Comparative Example 1 with Examples 1-3 and Experiments 2 and 3, it is clear that the specified diene included in the claimed invention was used, the molecular weight of the obtained copolymer increased.

(2) From a comparison of Comparative Example 1 with Experiment 1, it is clear that 1,5-hexadiene as a diene out of the scope of the claimed invention was used, the molecular weight of the obtained copolymer decreased.

That I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above identified application or patent issued thereon.

Signed this 28th day of July, 2006

Nobuo Oi

Nobuo Oi

Table

	Monomers			Results		Notes
	Ethylen (MPa)	Vinylcyc- loHexane (mol/1)	Diene (mol/1)	[ $\eta$ ] (dL/g)	Tg (°C)	
Comparative Example 1	0.1	5	None	0.53	94	Control
Example 1	0.1	5	o-divinylbenzene 0.1	0.74	93	Claimed Invention
Example 2	0.1	5	1,9-decadiene 0.02	0.68	98	Claimed Invention
Example 3	0.1	5	1,9-decadiene 0.03	Insoluble	87	Claimed Invention
Experiment 1	0.1	5	1,5-hexadiene 0.1	0.40	-	Not Claimed Invention
Experiment 2	0.1	5	1,7-octadiene 0.1	0.58	-	Claimed Invention
Experiment 3	0.1	5	1,9-decadiene 0.1	Insoluble	71	Claimed Invention

Polymerization conditions: 300 ml glass reactor, polymerization temperature; 50°C., polymerization time; 30 minutes, solvent; toluene (Total 50ml)

Catalyst: isopropylidenebis(indenyl)zirconium dichloride 2.5  $\mu$ mol,

Co-catalyst: MMAO 5 mmol